



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/940,988	08/28/2001	Michio Kadota	36856.541	7402
54066	7590	10/14/2005	EXAMINER	
KEATING & BENNETT, LLP 8180 GREENSBORO DRIVE SUITE 850 MCLEAN, VA 22102			KIM, PAUL D	
			ART UNIT	PAPER NUMBER
			3729	

DATE MAILED: 10/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/940,988

Applicant(s)

KADOTA ET AL.

Examiner

Paul D. Kim

Art Unit

3729

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

This office action is a response to the request for reconsideration filed on 8/17/2005.

Claim Objections

1. Claims 2-7 are objected to because of the following informalities:

Re. Claims 2-7: The phrase "A method" as recited in line 1 needs to be changed as --The method--.

Re. Claims 2 and 3: The phrase "is shifted" as recited in line 3 appears to be --are shifted--.

Re. Claims 5 and 7: The phrase "the positions of the edges which define the predetermined distance" as recited in lines 2-3 of claim 5 and lines 3-4 of claim 7 is confused. According to claim 1, lines 6-7, the limitation recites "a pair of edges...which define a predetermined distance". What or where are the positions of the edges indicated to define the predetermined distance?

Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki et al. (JP 61-6919).

As per claim 1 Masaaki et al. teach a process of adjusting a frequency of an edge reflection type surface acoustic wave device comprising a process of determining a frequency characteristic of a first edge reflection type surface acoustic wave device (2) having a piezoelectric substrate (1) as shown in Fig. 2 that is the first edge reflection type surface acoustic wave device cut from a piezoelectric wafer (1a) as shown in Fig. 4, the edge reflection type surface acoustic wave device having a pair of edges of the piezoelectric substrate which define a predetermined distance therebetween (such as $\lambda/2$) as shown in Fig. 2 and a process of cutting the piezoelectric wafer for additional edge reflection type surface acoustic wave devices, which are subsequently cut from the piezoelectric wafer after the first edge reflection type surface acoustic wave device is cut (as shown in Figs. 2 and 4, and Page 3, left & lower column, lines 1-9). According to Fig. 9 of Masaaki et al., the frequency characteristic of the edge reflection type surface acoustic wave device is to be higher when a distance (or cutting position gap) of at least one of a pair of positions (or a pair of electrode fingers) is shorter (such as negative frequencies) than the predetermined distance, and the frequency characteristic of the edge reflection type surface acoustic wave device is to be lower when a distance (or cutting position gap) of at least one of a pair of positions (or a pair of electrode fingers) is longer than the predetermined distance (such as $\lambda/2$ as indicated as "0").

Even though Masaaki et al. do not teach the processes of cutting the additional edge reflection type surface acoustic wave device either longer or shorter from the

piezoelectric wafer, Fig. 9 of Masaaki et al. show the frequencies changes when the surface acoustic wave devices are cut either longer or shorter than the predetermined distance such as $\lambda/2$. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify a process of fabricating the edge reflection type surface acoustic wave device of Masaaki et al. by cutting the surface acoustic wave devices either longer or shorter than the predetermined distance from the piezoelectric wafer in order to obtain desired value of the frequency of the edge reflection type surface acoustic wave device.

As per claims 2 and 3 the positions at which the piezoelectric substrate can be cut in the piezoelectric substrate shifted from positions of the edges which define the predetermined distance in the frequency characteristic obtaining step by about $\lambda/8$ or $\lambda/16$ or less as shown in Fig. 9., where the λ is wavelength of a shear horizontal type surface wave to be excited in the edge reflection type surface acoustic wave device. Even though Masaaki et al. do not teach cutting the additional edge reflection type surface acoustic wave device shifted from positions of the edges by about $\lambda/8$ or $\lambda/16$ or less, it would be also obvious to modify a process of fabricating the additional edge reflection type surface acoustic wave device to cut the additional edge reflection type surface acoustic wave device shifted from positions of the edges by about $\lambda/8$ or $\lambda/16$ or less in order to obtain desired value of the frequency of the edge reflection type surface acoustic wave device.

As per claim 4 the edge reflection type surface acoustic wave device of Masaaki et al. comprises a single electrode type interdigital transducer as shown in Fig. 2.

As per claim 5 the positions of the edges of the reflection type surface acoustic wave device as shown in Fig. 2 are located at approximate centers of electrodes.

4. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Masaaki et al. in view of Michio et al. (JP 2000-059175).

Masaaki et al. teach all of the limitations as set forth above except a double electrode type interdigital transducer of the edge reflection type surface acoustic wave device. According to Figs. 1 and 4, Michio et al. teach a double electrode type interdigital transducer of the edge reflection type surface acoustic wave device for adjusting a frequency of an edge reflection type surface acoustic wave device (3,4). According to Figs. 4 and 5 of Michio et al., the frequency characteristic of the edge reflection type surface acoustic wave device is to be higher (A to E) when a distance of at least one of a pair of positions is shorter (E to A) than the predetermined distance, and the frequency characteristic of the edge reflection type surface acoustic wave device is to be lower (E to A) when a distance of at least one of a pair of positions is longer (A to E) than the predetermined distance. It is well known of art to fabricate the shear horizontal type surface acoustic wave device having a single of Masaaki et al. or double electrode type interdigital transducer of Michio et al. in order to control effectively the unnecessary ripple generated on frequency characteristics and to offer the surface wave equipment with a moderate band of end-face reflective molds such as a resonator and a filter.

Also, the positions of the edges of the reflection type surface acoustic wave device as shown in Fig. 1 are located at approximate centers of electrodes (as per claim 7).

Response to Amendment

5. Applicant's arguments filed 8/17/2005 have been fully considered but they are not persuasive. Applicant argues that the prior art of record fails to disclose the claimed invention such as cutting additional surface acoustic wave devices. Examiner traverses the argument. According to Figs. 2 and 4 (Page 3, left & lower column, lines 1-9) of Masaaki et al., the plurality of the reflection type surface acoustic wave devices are cut (by f-f') from the wafer, and further cut the wafer into a plurality of the reflection type surface acoustic wave devices as shown in Fig. 2. In addition, Fig. 9 shows the frequency changes by cutting portion gap such as a width of the electrode finger so that the frequencies is high when the cutting portion gap is shorter (negative based on $\lambda/2$) and the frequencies is low when the cutting portion gap is longer (position based on $\lambda/2$).

Conclusion

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within

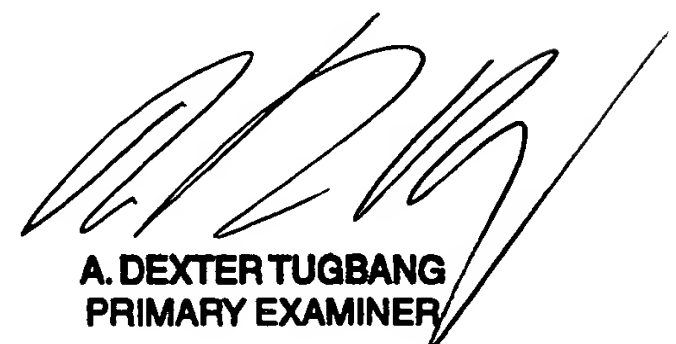
TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul D. Kim whose telephone number is 571-272-4565. The examiner can normally be reached on Monday-Friday between 7:00 AM to 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on 571-272-4690. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

pdk



A. DEXTER TUGBANG
PRIMARY EXAMINER